

## **ABSTRACT OF THE DISCLOSURE**

**[0069]** A combination, voltage converter circuit for use within an implantable device, such as a microstimulator, uses a coil, instead of capacitors, to provide a voltage step up and step down conversion functions. The output voltage is controlled, or adjusted, through duty-cycle modulation. In accordance with one aspect of the invention, applicable to implantable devices having an existing RF coil through which primary or charging power is provided, the existing RF coil is used in a time-multiplexing scheme to provide both the receipt of the RF signal and the voltage conversion function. This minimizes the number of components needed within the device, and thus allows the device to be packaged in a smaller housing or frees up additional space within an existing housing for other circuit components. In accordance with another aspect of the invention, the voltage up/down converter circuit is controlled by a pulse width modulation (PWM) low power control circuit. Such operation allows high efficiencies over a wide range of output voltages and current loads.